W.G. Krummrich Plant
History, 4-30-57

From MONSANTO CHEMICAL COMPANY

At Monsanto, Illinois

Date April 30, 1957

To Miss Charlotte Perabo Reference

At Main Office Subject W. G. KRUMMRICH PLANT HISTORY

CC

Attached is a history of the W.G. Krummrich Plant history requested in your memo of April 10.

We have attempted to cover all significant happenings in as brief a manner as possible.

We will be glad to furnish additional information on request.

J. Cresce

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PLANT HISTORY

(1951 Name change) May, 1957

Wm. G. Krummrich Plant — Organic Chemicals Division

formerly "B" Plant, Monsanto, Ill. Plant 1917 - 1951

The William G. Krummrich Plant is located in the village of Monsanto, Ill., approximately two miles south of East St. Louis. Total plant property consists of 250 acres, including 16 acres leased from the Chemical Warfare Service, and 138 acres of unoccupied land situated outside of the main plant fence. Several other major plants are located in the village of Monsanto, including a Socony-Mobil Oil Company refinery, the American Zinc Company electrolytic plant, Lewin-Mathes Metal Company, Sterling Steel Casting Company, Darling Fertilizer Company, a plant and headquarters of the Midwest Rubber Reclaiming Company and the Cahokia Power Plant of the Union Electric Company of Missouri.

East St. Louis got its start primarily as a railroad and packing house center; but over the years, heavy industry has located in the area. East St. Louis has had a history of craft unionism, strikes as a result of union organization and conflict with the operating management of companies, racial violence, hoodlums engaged in labor relations or affecting labor relations, and in some cases, a poor labor relations attitude on the part of industry management. Today, the city has a population of approximately 100,000. The majority of plants in the area are absentee owned. Slow, steady progress has been made in the field of management, labor and community relations in the last decade; and the community is gradually losing much of its former unsavory reputation.

The village of Monsanto was incorporated in 1926 at a time when annexation of the area by the city of East St. Louis appeared imminent. The village occupies 1.65 square miles and has a population of 400. Many village residents work at one of the plants in the area. On the basis of per capita assessed valuation, the village is one of the wealthiest in the United States.

The Krummrich plant is well located from the standpoint of physical resources. It is approximately one mile from the Mississippi River and barges are used to transport certain raw materials and finished products. A river barge terminal is currently being constructed on plant property at the river front to derive further economic gains offered by barge transportation. Two railroads serve the plant: the Alton and Southern Railroad from the south side; the Terminal Railroad Association from the north side. Tracks run through the plant from north to south, connecting with both railroad lines. The west side of the plant is adjacent to a four-lane section of Illinois Highway #3 affording good access and egress for truck transportation.

The Krummrich plant had its beginning in 1907 when the Commercial Acid Company acquired the land and built a chamber sulfuric acid plant, a muriatic acid plant, and a nitric acid plant. The same year, the Sandoval Zinc Company built a unit for the manufacture of zinc chloride adjacent to the acid plants. In 1915 the Commercial

Acid Company purchased the zinc chloride plant from Sandoval. With the entry of the United States into World War I, the business of the Commercial Acid Company increased. The plant prospered despite the fact that many additions to the plant were made by rule of thumb, i.e. a continuous succession of tearing down equipment which would not work properly and adding new equipment that also would not function as hoped. About this time, Monsanto was using many of the products produced by the Commercial Acid Company and saw the need for its own manufacture of these products to assure an adequate supply for internal consumption and future expansion. Monsanto purchased the Commercial Acid Company on November 1, 1917. At that time, the plant was producing phenol, salt cake, nitric cake and chlorosulfonic acid, in addition to sulfuric acid, muriatic acid, nitric acid and zinc chloride. The total plant employment in 1917 was 310.

## CHRONOLOGICAL HISTORY OF PRODUCTS MANUFACTURED AT KRUMMRICH PLANT

| Year | | Product |
|---|---|---|
| 1907 | - | Started production of sulfuric acid, muriatic acid, nitric acid and zinc chloride. |
| 1916 | - | Started commercial production of chlorosulfonic acid, phenol and salt cake. |
| 1925 | - | Started production of chlorine and caustic. |
| 1926 | - | Started production of chlorobenzols, p-nitroaniline and catalyst for contact sulfuric acid plants. |
| 1930 | - | Started production of nitrated organic chemicals. |
| 1931 | - | Started production of chlorophenols. |
| 1935 | - | Benzyl chloride manufacture started. |
| 1935 | - | Started production of Aroclors, hydrogenated products and phosphorus halides. |
| 1938 | - | Started production of phosphoric acid. |
| 1947 | - | Started production of 2,4-D, DDT and Santolubes in leased Chemical Warfare Service Plant. Started production of Santomerse #1 and alkylbenzene. |

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| 1950 | - | Started manufacture of potassium phenyl acetate. |
| 1951 | - | Started production of monochloroacetic acid. |
| 1954 | - | Started production of tricresyl phosphate and interim production of adipic acid. |
| 1955 | - | Started production of phosphorus Pentasulfide. |
| 1956 | - | Started production of Santolube 393 and fatty acid chloride. |

CHRONOLOGICAL HISTORY OF IMPORTANT PHYSICAL EXPANSIONS OF PLANT

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| 1907 | - | Constructed a four-chamber sulfuric acid department. |
| | | Constructed a four-furnace muriatic acid department. |
| | | Constructed four retort nitric acid department. |
| | | Constructed zinc chloride department. |
| | | Constructed powerhouse consisting of two 40 H.P. fire tube boilers. |
| 1911 | - | Added wedge furnace to sulfuric acid plant to permit manufacture of pyrate instead of sulfur. Added concentrator to convert 60° BE acid produced to chambers to 66° BE acid. |
| 1912 | - | Disastrous fire on January 8; destroyed sulfuric acid chambers, sulfuric acid concentrator, and most of muriatic acid department. Units rebuilt and expanded. |
| 1915 | - | Nitric acid plant destroyed by fire. |
| 1916 | - | Constructed two units to manufacture sulfuric acid by the contact process. Constructed enlarged nitric acid plant. Constructed chlorosulfonic acid department and a phenol plant. |

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| 1917 | - | Constructed new power house consisting of four boilers having a capacity of 1260 H.P. |
| 1918 | - | Constructed third chamber unit for production of sulfuric acid. |
| 1922 | - | Constructed chlorine plant, and new power plant on the site of the present power plant. Due to economic conditions, the chlorine plant was not placed in operation until 1925. Power plant consisted of 4-600 H.P. water tube Edgemoor boilers. |
| 1925 | - | Constructed plant for production of chlorobenzols. Constructed plant for production of p-nitroaniline. |
| 1930 | - | Constructed plant for production of nitrated compounds in old powerhouse, Bldg. BL. |
| 1931 | - | Built plant for the production of chlorophenol. Increased the capacity of the phenol plant. |
| 1935 | - | Constructed Diamond chlorine cell house. |
| 1936 | - | Constructed facilities for the production of Aroclors, pyranols, phosphorus trichloride, phosphorus oxychloride, and hydrogenated products. Two 100,000# steam/hr. high pressure boilers added to powerhouse. |
| 1937 | - | Expanded chlorobenzol production facilities. |
| 1938 | - | Constructed horizontal burning unit for the production of phosphoric acid. Constructed department for the production of tetra sodium pyrophosphate. |
| 1940 | - | Added one 100,000#/hr. high pressure boiler. |
| 1941 | - | Expanded chlorine production facilities by adding Hooker cell house. Chemical Warfare Service plant constructed in North Area. |
| 1942-44 | - | Phenol Department expanded by 66 per cent. |

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| 1946 | - | Expanded chlorine production facilities. Installed larger capacity Hooker cells and double effect caustic evaporators. |
| 1947 | - | Constructed plant for the production of Santomerse and alkylbenzene. Two additional 100,000# steam/hr. high pressure boilers added. |
| 1951 | - | Installed equipment for the production of monochloroacetic acid. |
| 1953 | - | Added 200,000#/hr. steam boiler and new feed water treatment facilities. |
| 1954 | - | Expanded alkylbenzene department. Expanded phosphoric acid production by construction of #3 burning unit. Expanded phosphorus trichloride and oxychloride production capacity. Expanded sulfuric acid facilities by the addition of a 400 T/day contact unit. Started construction of the phosphorus Pentasulfide plant. Expanded oil additives department by 40 per cent. |
| 1955 | - | Constructed central HCl recovery plant. |
| 1956 | - | Constructed units for the production of fatty acid chloride and Santolube 393. |

HISTORY OF PLANT MANAGERS

| Dates | Plant Manager |
|---|---|
| 1917-1930 | Dr. L. F. Nickell |
| 1930-1936 | Mr. F. B. Langreck |
| 1936-1941 | Mr. D. D. Dinsmoor |
| 1941-1943 | Mr. W. G. Krummrich |
| 1943-1950 | Mr. P. M. Tompkins |
| 1950-1955 | Mr. R. S. Wobus |
| 1955- | Mr. J. Cresce |

1959 - Salem ?
1966 - Mc Clain ?

## HIGH LIGHTS OF PLANT HISTORY, OTHER THAN EXPANSIONS AND NEW PRODUCTS

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| 1937 | - | Voluntary recognition granted to A.F.L. Union at plant, and first contract signed. |
| 1941 | - | First strike in plant history. Strike essentially jurisdictional in nature over attempts of mechanical craftsmen to obtain better wages than rest of men in plant. |
| 1951 | - | Plant named for W. G. Krummrich. Previously the plant had been known as Plant "B". |
| 1956 | - | Plant broke previous all-time safety record on December 19, by working 2,580,461 hours without a lost-time accident. |

## PLANT EMPLOYMENT DATA

| Year | Number of Employees |
|---|---|
| 1917 | 310 |
| 1928 | 340 |
| 1938 | 731 |
| 1940 | 1000 |
| 1941 | 1188 |
| 1942 | 1667 |
| 1943 | 1628 |
| 1945 | 1447 |
| 1946 | 1568 |
| 1947 | 1598 |
| 1948 | 1981 |
| 1949 | 2027 |
| 1951 | 2100 |
| 1952 | 2352 |
| 1953 | 2160 |
| 1954 | 2073 |
| 1955 | 1902 |
| 1956 | 1929 |
| 1957 | 1907 |

Over 100 chemicals are produced at the Krummrich plant. The plant is primarily a producer of heavy and intermediate chemicals, many of which serve as raw materials for other operations in the Krummrich plant or other Monsanto plants. On the basis of the dollar value of manufacturi machinery and equipment, the Inorganic Chemicals Division owns approximately 38 per cent of the plant.

Principal Inorganic Chemicals Division products include:

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| Sulfuric Acid | - Basic heavy chemical. Used in steel mills, oil refineries, tanneries. Used to manufacture fertilizer and phenol. |
| Phosphoric Acid | - A basic chemical used to manufacture fertilizer and food grade phosphates. Significant portion of plant's production is sold to the Carondelet plant for manufacture of various phosphates. |
| Alkylbenzene | - Used primarily for the manufacture of synthetic detergents. |
| Phosphorus Oxychloride | - Used to manufacture the various phosphate esters which are used as plasticizers and gasoline additives. |
| Phosphorus Pentasulfide | - Used internally in Monsanto to manufacture oil additives and insecticides. Sold externally to manufacture oil additives. |
| Vanadium Catalyst | - Catalyst for contact sulfuric acid plants. |

Principal Organic Division products include:

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| Nitrochlorobenzene | - Used within plant to produce p-nitroaniline and p-nitrophenol. Significant portion of production sold to Queeny plant. |
| Phenol | - Basic organic building block chemical. Significant portion of plant output used by Plastics Division to produce phenolic resins. |
| Santosite (Sodium Sulfite) | - By-product from the phenol process. Used in paper manufacture and as a reducing agent to remove oxygen from boiler feed water. |
| Salt Cake (Sodium Sulfate) | - By-product from the phenol process primarily used to manufacture glass. |
| Chlorine, Caustic and Hydrogen | - All plant production used within plant to produce other chemicals. |

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| Chlorobenzols | - Used as building blocks within plant to produce other intermediates. p-Dichlorobenzene (Santochlor) used as a mothicide and larvacide. |
| Pentachlorophenol | - Used to protect wood against rot and termites. |
| Benzyl Chloride | - Used as a building block within company to produce plasticizers, resins, pharmaceuticals and dyestuffs. |
| Aroclors | - Used as plasticizers, and dielectrics for condensers, capacitators and transformers. Used as a heat transfer medium, high temperature lubricants and hydraulic fluids. |
| Tricresyl Phosphate (G-Grade) | - Used as a gasoline additive. |
| Cyclohexylamine | - Used to manufacture corrosion inhibitors and dyestuffs. |
| p-Nitrophenol | - Used to manufacture insecticides. |
| Santolubes | - Plant produces a complete line of sulfonated detergent type oil additives |
| 2,4-D | - Used as a herbicide. |

May, 1957